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A COMPARISON OF THE SHORT-TERM EFFECTS OF CERTAIN TYPES OF TELEVISION PROGRAM MATERIALS.

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THE STUDY TESTED THE FOLLOWING HYPOTHESES--(1) IN THE PERIOD IMMEDIATELY FOLLOWING EXPOSURE TO A SUBSTANTIAL AMOUNT OF TELEVISED MATERIAL, STUDENTS EXPERIENCE A REDUCED CAPACITY FOR CONSTRUCTIVE MENTAL WORK, (2) HIGH SUSPENSE MATERIALS PRODUCE A MORE MARKED SHORT-TERM EFFECT ON MENTAL ACTIVITY THAN DO STANDARD EDUCATIONAL FILM MATERIALS, AND (3) OBSERVED CHANGES ARE CONSISTENT FROM ONE AGE GROUP TO ANOTHER. SUBJECTS FOR THE STUDY (230) WERE DRAWN FROM 8TH AND 10TH GRADES FROM FOUR CALIFORNIA COMMUNITIES. THE EFFECT OF TV MATERIAL IN REDUCING CAPACITY FOR CONSTRUCTIVE MENTAL WORK APPEARS SMALLER THAN THE AMOUNT OF VARIATION FROM TEACHER TO TEACHER IN A CONVENTIONAL SCHOOL SYSTEM. THERE SEEMS TO BE NO EVIDENCE TO SUPPORT THE IDEA OF DIFFERENCE IN SHORT-TERM EFFECT BETWEEN HIGH-SUSPENSE AND EDUCATIONAL FILM MATERIAL. (JK)

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Do TV Films Make Problems for Conventional School Classes?

Purpose of the study

The purpose of the study was to compare the effect of two kinds of television-type program materials and a conventional classroom situation on the performance of mental work. The research was aimed at finding out whether or not certain typical television materials affect a child's capacity for constructive mental activity in the period immediately following the presentation.

So far as could be determined, no previous study had been made of the short-term effect of television-type materials on immediately adjacent school activity.

Witty (1) and others report some indications that large amounts of television viewing outside school may be associated with poor school work. Belson (2), in his work with the British Broadcasting Corporation, reports a marked decline in acts of initiative by persons viewing a good deal of television. Glynn (3) is concerned with the passivity encouraged in the viewing of television as exhibited by subjects in a clinical situation. A consideration of findings such as these suggests the usefulness of an attempt

to measure the immediate short-range effect of specific televised material on the ability of students to do mental work.

Hypotheses

The study is intended to test the following hypotheses: (1) In the period immediately following exposure to a substantial amount of televised material, students experience a reduced capacity for constructive mental work. (2) High suspense materials produce a more marked short-term effect on mental activity than do standard educational film materials. (3) Observed changes are consistent from one age-grade group to another.

Subjects

Subjects for the study were drawn from ten different classroom groups in four California communities ranging in size from a town of approximately 2,000 to a major metropolitan area (Los Angeles). All subjects were drawn from eighth or tenth grade classes. In schools where classes were sectioned according to ability, one of the non-extreme groups was used. Subject matter of the classes from which subjects were drawn included English, history, mathematics, and social studies. Approximately 230 students participated in the study. They were drawn from both Northern and Southern parts of the state of California.

Experimental Design

Each class studied was divided into two subgroups

which were matched for sex and general educational ability as measured by a standard test. On the first day of the study, subgroup A attended a regular class conducted by the regular teacher and following the class was subjected to a 30-minute test from the Differential Aptitude Test Battery. Tests used were: the test of abstract reasoning, the test of verbal reasoning, and the test of numerical ability. The specific test used was chosen so that it would have no direct relationship to the subject matter being presented in the class. While group A was attending class, the group B section was shown a television film of approximately the same length as the class period. Immediately following the projection of the film this group was given the same test as section A of the class.

On the second day of the study the two groups were reversed. Group B attended the regular class and group A saw the projection. Each group was then given an alternate form of the same test used the previous day.

This pattern of testing was followed with each of the ten groups tested. Every effort was made to standardize conditions under which the pairs of tests were given. Exactly parallel instructions were used. The time lapse between the class or film and the administration of the test was kept at an absolute minimum (about 5 minutes used for instructions) in order to secure the impact of any transient effects which might have been produced.

Program Materials Used

Two kinds of program materials were used. For six of the classes a standard full color 44-minute educational film was used. The film "Eighteenth Century Life in Colonial Williamsburg" was selected. This film has been widely praised as an excellently produced piece of film teaching. It is not, however, closely tied to the subject matter of any particular class. It narrates a typical day in the lives of members of an eighteenth-century community including domestic affairs, the carrying on of vocations, and social life. Students to whom this film was shown exhibited active interest and appeared to be giving excellent attention during the showing.

To provide material for the other four classes, a national television network was asked to supply high suspense dramatic entertainment films such as a "western" or mystery show. In consultation with the regional manager of the network, two highly dramatic 28-minute programs were selected. One of these was an episode in the Range Rider series--a film showing the hero settling a bloody feud between the cattle men and the sheep men and then riding off with the beautiful daughter of one of the principals. It was found that this film had been seen two years previously by only two of the children, and so it was new material. The second film was a pilot film produced to inaugurate a new series of "westerns." It had never been released anywhere. The plot involved the selling of guns to Indians and included a good deal of shooting and other

types of violence. Both films were greeted with enthusiasm by the viewers.

At each showing the subjects were told that they were to see a film and then were to have some sort of test following it. They were urged to enjoy the films but were given no other incentive to listen or to remember what they saw.

Every effort was made to completely standardize the conditions under which the two tests were given. Where two groups were tested simultaneously and two investigators were engaged in testing, it was arranged that the same individual should be in charge of a group when it was tested following the class and when it was tested following the film. Attempt was made to eliminate intervening distractions between the class or film and the test. In general, testing was done in the same room that was used for the class or the projection in order to eliminate uncontrolled sources of distraction.

The teachers who participated in the experiment were selected by the principal or superintendent in each community. They were chosen as excellent and experienced teachers and as persons who would be sympathetic and cooperative with the purpose of the study. It is most probable that they represented a somewhat higher degree of teaching proficiency than the average level in the schools where the testing was done. However, the arbitrary limitation of our subjects to eighth and tenth grade students

restricted the choices open to the administrator. It seems then that the teaching represented was, perhaps, above average but within the normal range of instruction offered in the schools tested.

Observation of students during the projection of the films indicated that attention was generally well secured and held. During the "western" television films, there were probably more breaks in attention than were observed during the educational film. In some spots during the "western" films, where the dramatic intensity of the action was intended to be high, some of the children laughed. The nick-of-time arrival of the hero to rescue the heroine was as likely to be greeted by laughter as with evidence of relief. Obviously the suspension of disbelief was somewhat less than complete. Attention appeared to be rather better during the educational film than during the "westerns." Students were quiet and orderly and proceeded immediately to the tests upon completion of the film.

There was general curiosity after the testing situation as to the intended relationship between the film and the test. One boy guessed that the purpose of the film might have been "to make us sleepy." No visible symptoms of drowsiness were observed, however. Following the second day of testing, answers were given to any student questions concerning the purpose of the tests. In several instances the students were allowed to guess on which test they did the best. Some guessed the test following the film; some

guessed the test following the class. They were able to offer rationalizations for each point of view.

Matching the Sample.

Considerable care was taken to assure that the two sets of test results were matched in every regard except that of the immediately preceding stimulus. It was assumed there would be a practice effect which would tend to raise the score on the second test administered. This proved to be true. For this reason, care was taken to insure that the size and general characteristics of the group taking the first test after the film were the same as the size and general characteristics of the group taking the first test after class. Though the experimental groups were approximately so matched to begin with, it was necessary to randomly discard a few cases in order to complete the balance. These two groups were approximately matched according to general educational ability and sex. For each of the subgroups shown in Table II the number of students taking their first test after class was exactly the same as the number taking the first test after the film. The influence of practice effect was thus eliminated.

According to the test publishers, raw scores on the two forms of the test differ slightly. For this reason percentile ranks were used for most comparisons. However, where total group comparisons are being made and the total balance of first and

second tests is as indicated above, there is no reason why means of the raw scores should not also be compared.

General Analysis of Results

The simplest way to get at differences in work capacity following the two different stimulus situations is by comparison of the two percentile ranks earned by each student on successive administrations of the test. Before these comparisons were made, each group was carefully rechecked to be certain that equal numbers of subjects in each group had received their first test following the film and following the class. It was found that practice exerted considerable influence in improving scores on the second administration, so this matching prevented any reflection of practice effect in the final result.

Table I shows direct comparisons between post-film and post-class test performances. The number of subjects represented in Table I is 195, which is our total of 226 subjects minus 31 who received identical scores on the two tests. In the male-female comparisons, as noted, it was necessary to discard 12 additional subjects to eliminate possible practice effect.

The obvious comment on the table is that there appears to be a rather consistent tendency for all of the subdivisions of the sample to perform better on the test after class than after the film. On the face of it, this would appear to support the hypothesis

Table I

Table Comparing Test Performance of Sub-Groups Following Film and Following Regular Class

	Total Number	Subjects Scoring Higher After Class		Subjects Scoring Higher After Film	
		Number	Percent	Number	Percent
ALL SUBJECTS:	195	106	54.4	89	45.6
Abstract Reasoning Test	82	46	56.1	36	43.9
Numerical Ability Test	63	34	54.0	29	46.0
Verbal Reasoning Test	38	20	52.6	18	47.4
All Subjects--Western Film	65	36	55.4	29	44.6
All Subjects--Educational Film	130	70	53.8	60	46.2
All high mental ability subjects	91	50	54.9	41	45.1
All low mental ability subjects	103	56	54.4	47	45.6
All tests 8th grade subjects	130	66	50.8	64	49.2
All tests 10th grade subjects	65	40	61.5	25	38.5**
All tests--female subjects	*89	54	60.7	35	39.3**
All tests--male subjects	*94	46	48.9	48	51.1

* In comparing male and female subjects it was necessary to randomly pull out 12 additional subjects to balance the number receiving their first test after class with those receiving their first test after the film.

** Significant at approximately the 5% level on the Wilcoxon sign-rank test.

that the conventional class is better preparation for intellectual activity than is an educational film. This assumption, however, needs further careful examination.

It is apparent that it makes no significant difference in our results whether we use an abstract reasoning test, a numerical ability test, or a verbal reasoning test as our mental task. Gross examination of the data shows that the average performance on each of these tests was somewhat better after class than after the film.

Perhaps somewhat more surprising is that there is essentially no difference in the pattern of performance following the two highly exciting Western TV films in comparison with the educational film. Each group showed a slightly better performance after class than after the film.

In order to find out whether any influence attributable to the film might be related to the intelligence of the subject, mental ability test information was secured on all students. In some schools this was in the form of IQ scores; in some schools achievement test scores were available. Though certainly not equivalent, these scores were satisfactory for the purpose for which they were used. For each class the scores were ranked and the class was divided into a top half and a bottom half. The high mental ability subjects and the low mental ability subjects

resulting from this division were then handled separately. The result of the tabulation is shown in Table I. Essentially no difference appears between the performance of high ability and low ability subjects as a result of the two stimulus situations.

In comparing eighth grade subjects and tenth grade subjects, however, a sizable difference in performance appears. Tenth grade subjects show a significantly greater tendency to perform better after class than after the film. However, it should be noted that the differences appearing throughout the other comparisons are not entirely attributable to the presence of tenth grade subjects. The eighth grade subjects also performed better after class.

In comparing male and female subjects, however, we find that all the observed difference in performance in the two situations can be attributed to the female subjects. In fact, there is a non-significant tendency for male subjects to perform better after seeing the film.

Comparison of Means

Table II compares the post-class and post-film performances of each of the actual test groups used. As in Table I, small but generally consistent differences appear in the direction of better performance after class. Individually these mean differences are much too small to be significant, however, and there are several class groups in which the difference is in the reverse direction from

the majority trend. That is, most class groups did better on the test following class, but for two groups this was not true, and in another group the difference is so tiny that the raw score means differ in one direction and the percentile ranks in the opposite direction.

Table III shows the relationship of grade and sex of subjects to post-class and post-film tests. Though the differences are not significantly large, it is useful to note that results for eighth grade male subjects are in the opposite direction from those of female subjects. That is, on the average, girls did better than boys after class in both the eighth and tenth grade groups. Tenth grade boys did substantially better than girls after the film; eighth grade boys did better after class. This pattern suggests a sex related difference in reaction to either the film or the teaching situation. As the sex difference is not consistent and the film was shown under very carefully standardized circumstances, one is inclined to look for differences in teacher-student relations.

Teacher-Student Relations as a Variable

It would be desirable to be able to examine and in some way quantify the relationship between the individual teacher and his or her students. The only information readily available in this study is the relationship of teacher and student sex to performance. That is, we may ask whether a teacher of the same sex or a teacher of the opposite sex is more likely to produce a class which will stimulate the student

Table II

Summary of Means of Raw Scores and Mean Percentile Ranks
After Class and After Film

Group I: Stimulus Film: "Eighteenth Century Life"

Test	Group	Number	Raw Score Means		Mean Percentile Ranks	
			After Class	After Film	After Class	After Film
Abs. Re.	G-10	10	32.0	30.6	76.5	68.9
Num. Ab.	G-10	10	13.1	11.2	32.8	26.0
Num. Ab.	G-8	12	14.92	14.33	51.5	50.75
Abs. Re.	G-8	14	28.71	26.71	70.29	63.86
Verb. Re.	P-8	24	20.17	19.96	66.92	65.37
Verb. Re.	P-10	22	32.82	32.18	80.77	78.86
Abs. Re.	SR-8	30	30.10	31.97	76.4	77.3
Num. Ab.	SR-8	26	14.00	14.92	50.2	54.7
	Group II: Stimulus Film: Two Television Westerns					
Abs. Re.	SH-8	42	32.29	32.17	78.33	78.62
Num. Ab.	SH-10	36	17.31	17.06	47.61	47.36

Table III

Comparison of Post-Class and Post-Film Test Scores for Male and Female Subjects

Sex of Subjects	Grade	Test	Number of Subjects	Mean Percentile Rank After Class	Mean Percentile Rank After Film
Female	8	All Tests	75	67.60	66.36
Female	10	All Tests	27	53.89	50.81
Male	8	All Tests	73	67.73	70.56
Male	10	All Tests	39	62.62	60.59

to mental activity. As the experiment was not set up to answer this question we are concerned only with finding out whether or not this factor may have produced the differences in performance noted above. Table IV shows a tabulation of students scoring high after the film and students scoring high after class. The table is broken down in such a manner as to indicate whether the student's teacher is of the same or different sex. The table is based on 195 subjects who showed a difference between post-class and post-film tests.

Considering the 56 students who were in the class of a female teacher, we find that there is a marked tendency for male students to score high after the film and for female students to score high after the class. On a chi square this is not significant in our present sample. In looking at the results in classes conducted by male teachers, we observe that both male and female students perform substantially better after class than after the film.

Inspection of the individual class groups in Table IV shows a pattern of post-test and post-film scores which shifts from sample to sample.

Discussion

When the hypotheses for this study were set up, it was assumed that if superior teachers were selected in each school system and if test subject matter was specifically unrelated to the content of either the class or the film, a mean level of classroom stimulation would result against which the effect of the films could

Table IV

A Comparison of Post-Class and Post-Film Performances of Male and Female Students Under Male and Female Teachers

Classes Conducted by Female Teacher

Sample	Test	High Score After Film		High Score After Class	
		Male Student	Female Student	Male Student	Female Student
SH-8	Abstract Reasoning	6	10	7	10
SR-8	Numerical Ability	10	4	2	7
	TOTAL NUMBER	16	14	9	17
Percent of Total for Each Sex		64%	45%	36%	55%*
Percent of Total High Scores After Class and Film		53.6%		46.4%***	

Classes Conducted by Male Teacher

SH-10	Numerical Ability	5	8	12	7
P-10	Verbal Reasoning	4	4	3	5
P-8	Verbal Reasoning	8	2	5	7
G-8	Numerical Ability	5	1	2	4
G-8	Abstract Reasoning	1	4	5	4
G-10	Numerical Ability	2	0	2	4
G-10	Abstract Reasoning	2	0	5	2
SR-8	Abstract Reasoning	6	7	8	5
	TOTAL NUMBER	33	26	42	38
Percent of Total for Each Sex		44%	41%	56%	59%**
Percent of Total High Scores After Class and Film		42.5%		57.5%***	

* On a chi square test the apparently sex-related difference in response to the female teacher falls below the 10% level of significance.

** On a chi square test there are no significant sex-related differences in response to male teachers.

*** Difference non-significant when standard error of proportion is tested.

be scaled.

Results seem to indicate a good deal more teacher-to-teacher variation in the stimulus value of the classroom situation than was anticipated. It appears likely that these class-to-class variations are influenced by the relative sex of teacher and student. The only statistically significant findings appear to be sex related.

Observation of students immediately following some of the classes would also lead to the subjective impression that substantial differences existed in the readiness of the students to tackle a mental job. One had the impression that in some situations the children were seething with repressed energy while in others they appeared to have been functioning efficiently and pleasantly. It seems safe to assume on the basis of our findings that much larger differences exist between the stimulus value of classes under different teachers than between two forms of projected or televised materials. In comparing film or TV materials with the conventional class it is quite apparently necessary to ask what class, taught by what teacher, under what circumstances.

It should be said that this study represents the minimal case for the use of film or television in an educational situation. That is, any skilled teacher would make use of a variety of devices to motivate attention to the presentation--promised tests, previews of content to be expected, questions to be answered, etc. Motivation of this sort was deliberately omitted from the test situation.

Hoveland, Sheffield, Lumsdaine (4) have shown the differences in retention resulting from such advance preparation. In summarizing a number of studies of educational television Schramm (5) reports subject matter preparation and integration into the teaching process as of prime importance. It is certain that such integration into the child's total experience would affect understanding and fact retention. It is possible that it would also affect subsequent mental alertness.

Consideration was given to substantially increasing the size of the sample in order to increase the probability of significant findings. This seemed unprofitable because each addition of subjects adds a new teacher, thereby adding additional variables.

With regard to the hypotheses being investigated, the present study supports the following statements:

1. Any effect of film and TV materials in reducing the student's capacity for constructive mental work appears to be smaller than the amount of variation from teacher to teacher in a conventional school system.

2. There seems to be no evidence, with the present samples and the stimulus materials used, to support the idea of a difference in short-term effect between high-suspense and educational-type film materials.

3. Difference of response between eighth and tenth grade subjects appears to have been produced by factors other than the filmed materials being compared.

The seemingly clear difference between eighth and tenth-grade subjects in Table I appears to be an artifact of the samples--Table IV shows that all tenth-grade classes were conducted by male teachers. This could readily account for the difference between eighth and tenth-grade groups.

In the particular samples used in this study, there is some indication that male teachers were more effective in stimulating mental alertness than were the female teachers. As the study was not designed for the evaluation of teachers, certainly no general conclusion is justified.

What this investigation points up rather clearly is that the gross differences between post-film and post-class performance for all children in the sample is very small--well below statistically significant levels. There is no present evidence of hazard to other school classes resulting from the after-effects of televised material. In contrast, there are sizeable variations among class groups in the relative performance on the two tests. These differences appear to be related to differences in the classroom environment.

Further Research

Results indicate that it might be profitable to study post-class productive capacity of students from different classes as a clue to the kind of stimulation provided by the class. A film might well be used as the standardizing measure in a study of this sort.

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